# CLAIMS

1. A fault-tolerant router, comprising:

a first router matrix card (122a), said first router matrix card (122a) receiving N parity encoded input digital audio data streams and generating, from said N parity encoded input digital audio data streams, a first set of M parity encoded output digital audio streams;

a second router matrix card (122b), said second router matrix card (122b) receiving said N parity encoded input digital audio data streams and generating, from said N parity encoded input digital audio data streams, a second set of M parity encoded digital audio streams;

an output card (128) coupled to said first router matrix card (122a) and said second router matrix card (122b), said output card (128) receiving said first set of M parity encoded output digital audio streams from said first router matrix card (122a) and said second set of said M parity encoded output digital audio streams from said second router matrix card (122b), providing, as an output therefrom, a selected one of said first and second sets of M parity encoded output digital audio streams, and switching from said selected one of said first and second sets of M parity encoded output digital audio data streams to an unselected one of said first and second sets of M parity encoded output digital audio data streams upon detecting a parity error in said selected one of said first and second sets of M parity encoded output digital audio data streams.

2. The apparatus of claim 1, wherein said output card (128) further comprises a switching circuit (136) coupled to receive said first set of M parity encoded output digital audio data streams from said first router matrix card (122a) and said second set of M parity encoded output digital audio data streams from said second router matrix card (122b), said switching circuit (136) switching from said selected one of said first and second sets of M parity encoded output digital audio data streams to said unselected one of said first and second sets of M parity encoded output digital audio data streams in response to assertion of a switching signal.

3. The apparatus of claim 2, wherein said output card (128) further comprises:

a first parity check circuit (130a) coupled to receive said first set of M parity encoded output digital audio data streams from said first router matrix card (122a);

a second parity check circuit (130b) coupled to receive said second set of M parity encoded output digital audio data streams from said second router matrix card (122b); and

a logic circuit (134) coupled to receive a first parity error signal from said first parity check circuit (130a) and a second parity check error signal from said second parity check circuit (130b), said logic circuit (134) determining, based upon said first parity error signal received from said first parity check circuit (130a) and said second parity error signal received from said second parity check circuit (130b), whether to assert said switching signal.

4. The apparatus of claim 3, wherein said output card (128) further comprises

a first delay circuit (132a) coupled to receive said first set of M parity encoded output digital audio data streams from said first router matrix card (122a); and

a second delay circuit (132b) coupled to receive said second set of M parity encoded output digital audio data streams from said second router matrix card (122b);

said switching circuit (136) coupled to receive said first set of M parity encoded output digital audio data streams from said first router matrix card (122a) and said second set of M parity encoded output digital audio data streams from said second router matrix card (122b) via said first delay circuit (132a) and said second delay circuit (132b), respectively.

5. The apparatus of claim 3, wherein said logic circuit (134) asserts said switching signal upon detection of said parity error in said selected one of said first and second sets of M parity encoded output digital audio data streams regardless of whether a parity error is present in said unselected one of said first and second sets of M parity encoded output digital audio data streams upon detection.

6. The apparatus of claim 3 wherein said logic circuit (134) asserts said switching signal upon detection of said parity error in said selected one of said first and second sets of M parity encoded output digital audio data streams only if a parity error is not present in

said unselected one of said first and second sets of M parity encoded output digital audio data streams.

7. The apparatus of claim 3, wherein said switching circuit (136) switches back from said unselected one of said first and second sets of M parity encoded output digital audio data streams to said selected one of said first and second sets of M parity encoded output digital audio data streams upon deassertion of said switching signal.

8. The apparatus of claim 7, wherein said logic circuit (134) deasserts said switching signal upon detection of a parity error in said unselected one of said first and second sets of M parity encoded output digital audio data streams.

9. The apparatus of claim 7, wherein said logic circuit (134) deasserts said switching signal upon detection of a parity error in said unselected one of said first and second sets of M parity encoded output digital audio data streams only if no parity error is present in said selected one of said first and second sets of M parity encoded output digital audio streams.

10. The apparatus of claim 7, wherein said logic circuit (134) deasserts said switching signal upon detection of a parity error in said unselected one of said first and second sets of M parity encoded output digital audio data streams regardless of whether a parity error is present in said selected one of said first and second sets of M parity encoded output digital audio data streams.

11. For a broadcast router (100) having an input card (121), a first router matrix card (122a) and a second router matrix card (122b), said input card (121) transmitting a set of N input digital audio data streams to said first router matrix card (122a) and said second router matrix card (122b), said first router matrix card (122a) outputting a first set of M output digital audio data streams and said second router matrix outputting a second, replicated, set of M output digital audio data streams, a method of selecting one of said first and second sets of M output digital audio data streams as the output of said broadcast router (100), comprising:

propagating said first set of M output digital audio data streams through at least one components (124a) of said first router matrix card (122a);

each one of said at least one component (124a) of said first router matrix card (122a) adding at least one bit of information to said first set of M output digital audio data streams propagating therethrough;

propagating said second set of M output digital audio data streams through at least one component (124b) of said second router matrix card (122b); and

selecting one of said first and second sets of M output digital audio data streams as the output of said broadcast router (100) based upon a comparison of said at least one bit of information added to said first set of M output digital audio data streams to said at least one bit of information added to said second set of M output digital audio data streams.

12. The method of claim 11, wherein said at least one bit of information is comprised of at least one status bit.

13. The method of claim 11, wherein said at least one bit of information is comprised of at least one health bit.

14. The method of claim 13, wherein selecting one of said first and second sets of M output digital audio data streams as the output of said broadcast router (100) further comprises:

determining a first sum by adding said at least one bit added to said first set of M output digital audio data streams;

determining a second sum by adding said at least one bit added to said second set of M output digital audio data streams; and

selecting one of said first and second sets of N output digital audio data streams as the output of said broadcast router (100) based upon a comparison of said first sum to said second sum.

15. The method of claim 11, and further comprising:

encoding parity information into said first set of N input digital audio data streams prior to transmission of said input digital audio data streams to said first router matrix (124a) of said first router card (122a) and said second router matrix (124b) of said second router matrix card (122b), said first set of M output digital audio data streams output said first router matrix (124a) being a first set of M parity encoded digital audio data streams and said second set of M output digital audio data streams output said second router matrix (124b) being a second set of M parity encoded digital audio data streams;

checking said first and second sets of M parity encoded output digital audio data streams for parity errors;

selecting one of said first and second sets M parity encoded output digital audio data streams as the output of said broadcast router (100) based upon the presence of parity errors in said first set of N output digital audio data streams, the presence of parity errors in said second set of N output digital audio data streams and said comparison of said at least one bit of information added to said first set of M parity encoded output digital audio data streams to said at least one bit of information added to said second set of M parity encoded output digital audio data streams.

16. The method of claim 15, wherein selecting one of said first and second sets of M parity encoded output digital audio data streams as the output of said broadcast router (100) further comprises:

determining a first sum by adding said at least one bit added to said first set of M parity encoded output digital audio data streams;

determining a second sum by adding said at least one bit added to said second set of M parity encoded output digital audio data streams; and

selecting, one of said first and second sets of M parity encoded output digital audio data streams as the output of said broadcast router (100) based upon the presence of parity errors in said first set of M parity encoded output digital audio data streams, the presence of parity errors in said second set of M parity encoded output digital audio data streams and a comparison of said first sum to said second sum.